

SMART

Simulation and Modeling for Acquisition, Requirements and Training

1 April 2005



Topics

- **SMART Concept**
 - **SMART vs M&S**
 - **Genesis**
 - **Definition**
 - **Tenets**
- **SMART Implementation**
 - **SMART “Process”**
 - **Simulation Support Plan (SSP)**
 - **Policy and Guidance**
- **Summary**
- **Backups**



SMART vs M&S

Modeling and Simulation (M&S)

→ M&S tools, data, algorithms, scenario generation, VV&A, etc.

Simulation and Modeling for Acquisition, Requirements and Training (SMART)

→ The processes/procedures for applying M&S

- ✓ Collaboratively develop and execute a strategy to apply M&S
- ✓ Sharing data, algorithms, & tools, etc. across functions & phases
- ✓ Sharing data, algorithms, & tools, etc. across programs

SMART is the Army process for efficient and effective application of M&S within a program.



SMART

Genesis

Army extended the SBA concept to
***Simulation and Modeling for Acquisition,
Requirements and Training (SMART)***

- **SBA:** An Acquisition Process in which DoD and industry are enabled by robust, collaborative use of simulation technology that is integrated *across acquisition phases and programs*. **[SBA Roadmap]**
- **SMART:** Army SMART concept extends SBA to include the collaborative use of M&S across organizational and functional areas (analysis, systems engineering, test and evaluation, training and logistics). The SMART concept is that M&S can be integrated *through-out the system lifecycle, across M&S domains, acquisition phases, and programs*.



What is SMART?

SMART is a change in Army M&S business practices, exploiting M&S in systems engineering processes to facilitate collaboration and synchronization of effort across the total life cycle of Army systems.

- **SMART is NOT a program, it is a cradle-to-grave “business model”**
 - Systems Engineering, concept analysis, development, testing, training, and sustainment efforts will leverage M&S across the system life cycle.
- **SMART is about a change in Army acquisition practices**
 - Simulation support planning is conducted to determine how M&S can be used to reduce risk, cost and schedule.
- **SMART is about cross-functional, collaborative use of M&S**
 - The PM/prime contractor develops an M&S strategy that is integrated with and supports the acquisition strategy and entire system life cycle.

- **SMART is about leveraging success and reusing Army M&S**



SMART

Tenets

1. Planning for Simulation Support

- Continuous, collaborative, coordinated and documented

→ *KEY to successful implementation of SMART*

2. Collaboration

- Involve all key stakeholders in applying M&S
- Enabled by an ACE: shared environment of interoperable tools, databases and product/process models

3. Authoritative System Representation

- PM-approved description of a system's performance, behavior, and operation in the intended environment

4. Model & Simulation Reuse

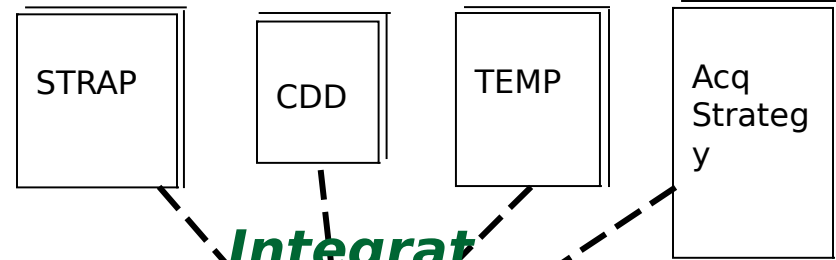


SMART

"Process"

**Simulation
Support
Planning**

*Collaboratively
Develop an
M&S strategy*



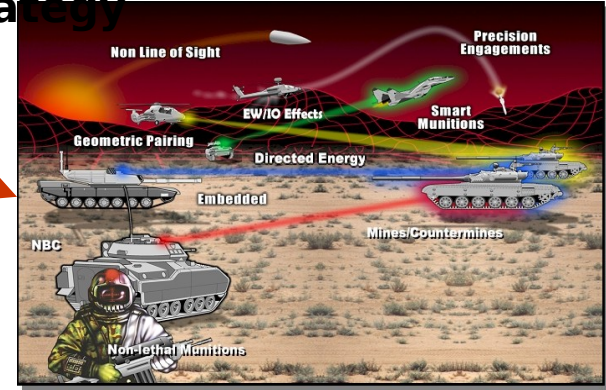
Integrate



*Coordinated
Execution of
the M&S
strategy*



**IAW
CJCS 3170
DoD 5000
AR 70-1
AR 5-11**



M&S capability



Simulation Support Plan (SSP) is a SMART Enabler

SMART is documented by the SSP

- **How SMART (tenets) will be implemented.**
- **An M&S strategy that describes the planned use of M&S as part of the overall acquisition strategy.**

An SSP depicts the how and when M&S tools are integrated, utilized and transitioned in the course of concept exploration and system development. [AR 70-1, DA Pam 5-12]

M&S and Simulation

CJCS: The process to identify capability gaps and potential solutions must be supported by a robust analytical process which incorporates ... modeling and simulation. **[CJCSI 3170.01c]**

DoD: Development and demonstration are aided by the use of simulation-based acquisition and test and evaluation integrated into an efficient continuum ... **[DoDI 5000.2]**

Army: The MATDEV plans, manages, documents and communicates the M&S approach and needs by maintaining a Simulation Support Plan (SSP). **[AR 70-1]**

Programs: SSP required for all ACAT I, II and non-major systems... **[AR 5-11]**

The PM articulates his M&S strategy via the SSP... **[DA Pam 70-3]**

Combat Development: Integrated Concept Teams (ICT) are established to develop concepts, and requirements documentation... The ICT produces the initial [simulation support] plan for management of simulations... **[TRADOC Pam 71-9]**

Advanced Technology Demonstrations: **[DA Pam 70-3]**

If an ATP includes significant simulations/simulator support...a SSP must be dev

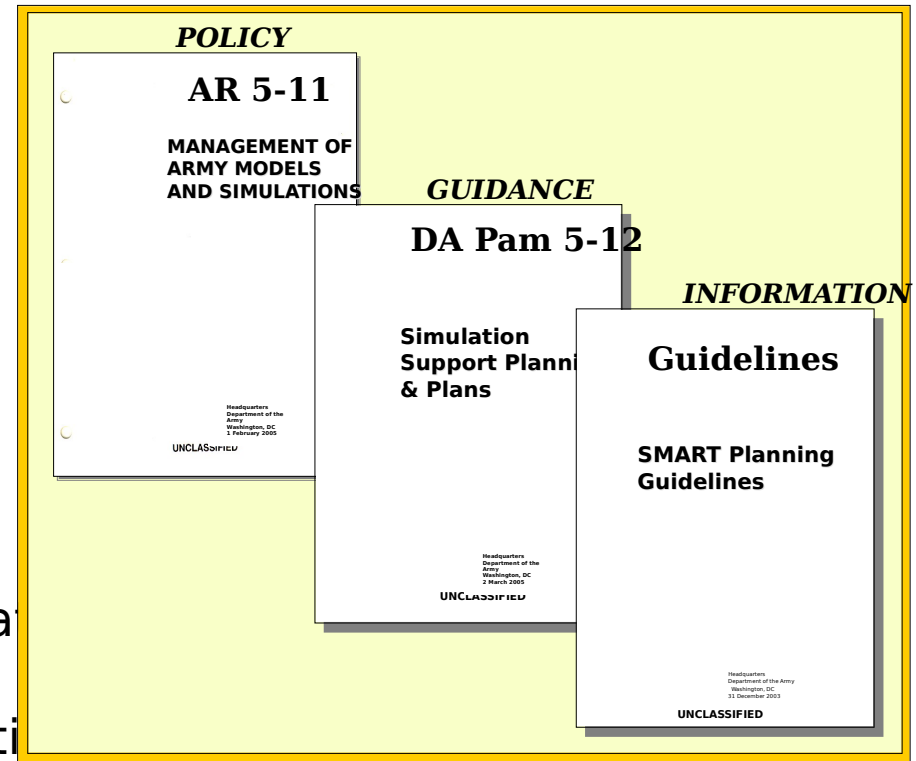
Army has required SSPs since 1996.



SMART and SSP Policy

Three tiers:

- ❑ AR 5-11 – revised to include SMART concept and clarify requirement for SSPs
- ❑ DA Pam 5-12 - Simulation Support Planning and Plans:
 - Detailed requirements for SSPs
 - SSP Proponent
 - SSP development/review/coordination
 - SSP format and content
 - Authoritative System Representation
- ❑ SMART Planning Guidelines
 - Sep 02, Appendix C revised – SSP management, form & content
 - Being updated to expand on DA Pam 5-12 guidance

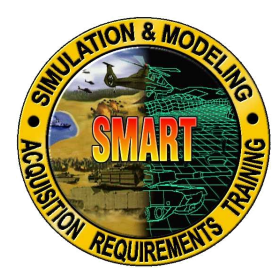




Summary

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- DoD and Army policy requires PMs to plan for the effective application of M&S in acquisition programs.
- SMART is the Army concept for the coordinated cross-domain use of M&S to reduce program risk & costs.
- Collaborative development of a program's M&S strategy, documented in a Simulation Support Plan, ensures efficient and effective application of M&S in the program.
- Focused management and coordinated execution of the M&S strategy are key to program success.



Backups



Simulation Support Plan (SSP)

- The SSP is a program management tool.
- Developing an SSP early helps to identify issues/concerns for early resolution.
- SSP development should include all key stakeholders to ensure “buy-in” and support of the M&S strategy.
- Having an SSP does not mean that the PM must develop a simulation of the system.
- As a minimum, every SSP should address:
 - M&S used to address interoperability issues.
 - M&S used to address life cycle cost.
 - M&S used to address system performance data.
 - M&S used to perform T&E.
 - M&S used to support training.



SSP

Coordination

- **Catch duplication**
- **Identify M&S investment needs**
- **Adherence to best practices**
- **Identify models used or required upgrades**
- **Identify adherence to approved standards (or to help identify places where new standards would be of use)**
- **Assist with cross domain coordination**
- **Allow for peer review/incorporation of lessons learned**
- **Ensure adequate VV&A**
- **Ensure effective use of Army SMEs (data/models)**
- **Ensure S&T (and other efforts) have**



IPT

Approach

The MATDEV will include M&S in the integrated product and process development (IPPD) to plan for early and disciplined integration of M&S that supports program design. [AR 70-1]

The preferred method for a PM to develop and/or update the SSP is through an M&S Integrated Product Team (IPT) comprised of representatives from Army agencies and the Prime contractor that are key stakeholders for the system being developed. [DA Pam 5-12]

The SSP is the PM / IPT guide for implementing SMART.



SMART

Assistance

- **AMSO reviews program SSPs**
 - Comments to PM
 - Best Practices identified and incorporated into SMART policy & guidance
- **Requirements Integration Working Group (RIWG)**
 - Established by Army M&S Executive Council (AMSEC)
 - Vets SSPs with Army M&S SMEs and organizations
 - Provides comments/recommendations to PMs
- **Army SMARTeam (AMSO, PEO STRI, TRADOC)**
 - Assists PMs with implementing SMART and SSPs
 - Harvests lessons learned (Reports on SMART website)



Best Practices

- 1. Use Key Performance Parameters (KPPs) and risk areas to focus M&S efforts. (ACS)**
- 2. Mapping ORD/CDD/CPD KPPs to models and simulations is a crucial initial step in determining how a program can benefit from M&S. (JTRS CI1)**
- 3. Ensure close collaboration between M&S developers and system testers & evaluators during model and simulation development and VV&A planning. (ATIRCM, JCM)**
- 4. Using a formal process facilitated understanding and analyzing how to apply M&S in the program and resulted in an executable M&S strategy. (JTRS CI1)**
- 5. Collaborate with Research Development and Engineering Centers to leverage expertise and**



Best Practices

6. **Determine model data requirements/sources early. (JCM)**
7. **Identify opportunities to develop/reuse/leverage models and simulations that can support test and training events, concurrently if combined test and training events are planned. (IMASE)**
8. **Use incentives to foster collaboration with contractors during down select. (ACS)**
9. **Plan for the orderly transition from modeled to operational SW and HW as testing & evaluation evolves. (ATIRCM)**
10. **Creating, documenting and executing an M&S strategy that supports a contractor down-select decision requires clear communication of that strategy and early coordination and collaboration of effort among key system stakeholders. (WIN-T)**



Website Info

- Practical information about how to do an SSP
- Information on how to get help with an SSP
- Updates on latest policy/guidance concerning SSPs
- SSP Template
- Army M&S Resource Repository:
<http://www.msrr.army.mil>
- Links to BCSE (AMSO) website - SSP/SMART Info:
www.amso.army.mil/smart